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Date: 5/22/2009 7:03 PM
Subject: May 20th San Diego Daily Transcript - Powers letter-to-editor
response to not-enough-wires viewpoint
Attachments: 20-may-09_SDDT_Powers_ltr_cost of urban PV compared to
remote wind.pdf; 16-mar-09_Solarbuzz_Spanish PV installs 2008_2460 MW.pdf

RETI Stakeholders:

There has been quite a bit of news/opinion lately about the need for new big wires in the San Diego area to get moving on meeting RPS targets. Attached are: 1) my May 20th letter to the editor to the San Diego Daily Transcript (San Diego's business newspaper) in response to a column that asserted remote wind energy is a lower cost renewable resource than urban PV, and 2) a trade article on Spain installing nearly 2,500 MW of PV in 2008. Below is a summary of these issues.

I. Spain installed 2,500 MW of PV in 2008, and Spain and California have similar populations. At that pace San Diego would reach 2,000 MW PV by 2020:

San Diego has 42 MW of PV. That is 1% of peak demand and approximately 0.3% of annual GWh.

California's population is 37 million. Spain's population is 40 million. Spain has a feed-in tariff with rates that are sufficient to assure that investors make some money on their PV investment. Last year Spain installed 2,460 MW of PV. See the attached file.

SDG&E is about 7 to 8% of California's total electrical demand (including POU's). If we use 8% and pro-rate from the PV Spain installed last year, San Diego would be installing $0.08 \times 2,460 \text{ MW/yr} = 197 \text{ MW/yr}$. Let's say 200 MW/yr.

San Diego Smart Energy 2020 advocates adding 2,000 MW of PV to urban/suburban San Diego by 2020. If California were to simply follow the PV pace that Spain was at in 2008 for ten years we would reach the SD Smart Energy 2020 target of 2,000 MW with a year to spare (and so would every other area in California). San Diego Smart Energy 2020 (Oct 07):
<http://www.etechninternational.org/new_pdfs/smartenergy/52008_SmE2020_2nd.pdf>
http://www.etechninternational.org/new_pdfs/smartenergy/52008_SmE2020_2nd.pdf

II. San Diego can already import more electricity than it uses on average:

It is frustrating that remote wind and solar advocates refuse to acknowledge that San Diego already has a 2,850 MW simultaneous transmission import capability for an electricity market that averages around 2,400 MW demand over the course of a year. On average we can already import more than 100% of our power needs. We are not short of

wires. However, those wires currently carry almost exclusively natural gas power, coal power, and nuclear power. Moving some of this conventional generation off the wires to make room for clean power is the next logical step, not building new wires while presuming the conventional generation will occupy the existing wires indefinitely.

III. Remote wind is not cheaper than urban PV in the case of San Diego:

The San Diego Daily Transcript - SDDT (San Diego business news) has been running opinion pieces that attack the cost of urban solar and promoting remote wind power as the most rapid path to addressing climate change. Below is the SDDT May 14th piece on wind power versus urban solar that prompted my letter-to-the-editor:

<http://www.sddt.com/Commentary/article.cfm?Commentary_ID=176&SourceCode=200_90514tza>

http://www.sddt.com/Commentary/article.cfm?Commentary_ID=176&SourceCode=2009_0514tza#

Bill Powers, P.E.
Powers Engineering

Letter to the Editor: Response to 'Erect, connect, repeat'

Wednesday, May 20, 2009

I would like to thank Mr. Dan Coffey for featuring my views on the cost of urban photovoltaic solar power in his May 14 piece titled "Erect, connect, repeat."

I am the author of the 2007 report "San Diego Smart Energy 2020" that advocates adding up to 2,000 MW of urban solar in San Diego County as a more cost-effective strategy to meeting renewable energy goals than exclusive reliance on remote renewable power that requires expensive and controversial new transmission capacity to reach San Diego. However, Mr. Coffey commits a number of errors and omissions in his effort to frame urban solar power as prohibitively expensive relative to wind power.

Smart Energy 2020 focuses on developing San Diego County's nearly 5,000 MW of commercial rooftop and commercial parking lot solar potential. The plan focuses on the larger commercial solar sites to take advantage of economies of scale. Mr. Coffey ignores this key element of the plan. Instead he creates his own plan that requires 540,000 residential rooftops to reach 2,000 MW. In reality, only 5,000 to 10,000 commercial solar sites would be required under Smart Energy 2020.

Mr. Coffey uses an installed solar price of \$6.15/watt to run his calculations. That is a reasonable price for a commercial solar installation in 2008. *The Wall Street Journal* recently reported that solar panel prices have fallen by \$2/watt since 2008, due to too much solar manufacturing capacity chasing too few solar projects. The 2009 installed solar price for large commercial solar should be closer to \$4/watt.

No matter. Mr. Coffey failed to account for the impact of U.S. tax policy on the net capital cost of solar installations. The 30 percent investment tax credit for solar has been extended to 2016. Solar projects also qualify for accelerated depreciation. The effect of these tax policies is to reduce the gross capital cost of solar by approximately 58 percent. The net capital cost for 2,000 MW of solar power in San Diego is \$5.2 billion, not the gross cost of \$12.3 billion cited by Mr. Coffey.

SDG&E increased its estimate of the capital cost of the proposed 1,000 MW Sunrise Powerlink transmission line to about \$1.9 billion in late 2008. Mr. Coffey advocates a strategy of importing wind power as the most cost-effective approach to tackling climate change. He overlooked the fact that to import 2,000 MW of wind power to San Diego would require two Sunrise Powerlinks, not one. That is \$3.8 billion in transmission cost to get 2,000 MW of wind power to San Diego.

How much do wind turbines cost to build and install? About \$2/watt. Building 2,000 MW of wind turbines would cost about \$4 billion. Adding the wind turbine and wind transmission costs together give a total of \$7.8 billion. That is significantly higher than \$5.2 billion for 2,000 MW of urban solar. In 2009 the \$5.2 billion for urban solar is more like \$3.5 billion due to the recent decline in solar panel prices.

If I am a savvy renewable energy investor and desire to see 2,000 MW of renewable energy in San Diego as fast as possible, I would lead with urban solar and follow with wind, not the reverse.

It is important to mention that wind power gets a very healthy tax subsidy in the form of a 2.1 cents per kilowatt-hour production tax credit. It is the policy of the nation to encourage development of solar and wind through the tax code. We have done this before. Oil and gas, coal, nuclear and hydro received an estimated \$500 billion in tax subsidies from 1950 to 1977 alone.

I think Mr. Coffey genuinely wants to address climate change and I am glad to engage in a debate about the most efficient way to achieve that end. I do believe that, when we put all the costs on the table, there is no question that urban solar should be the centerpiece of our strategy and not an afterthought.

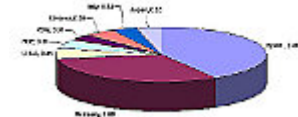
-- Bill Powers, Powers Engineering
Author, "San Diego Smart Energy 2020"



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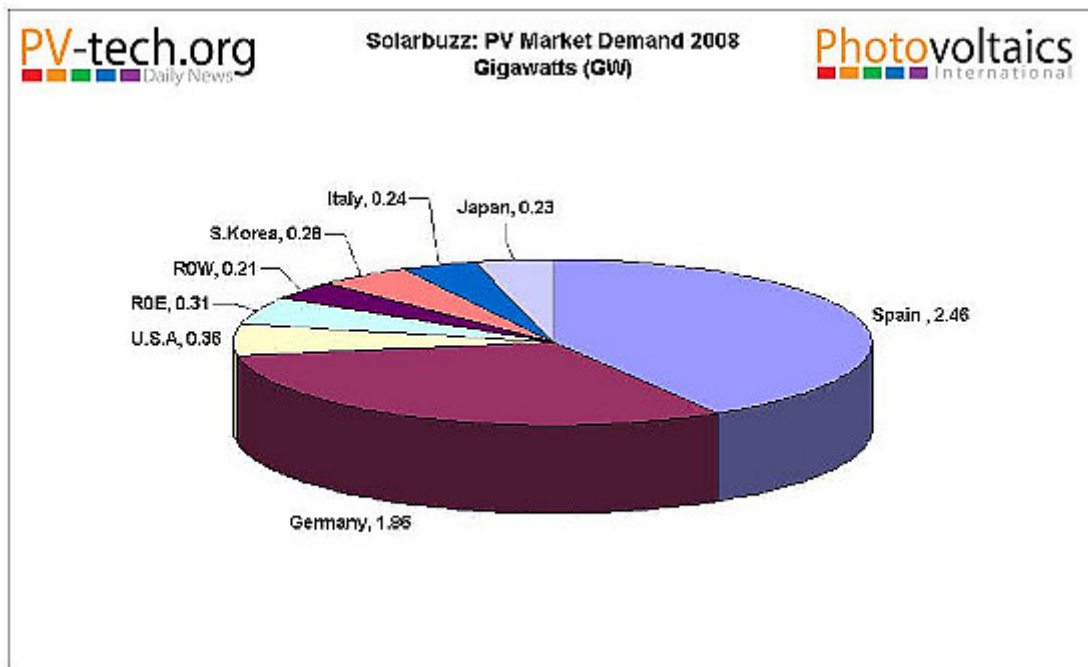
Worldwide photovoltaics installations grew 110% in 2008, says Solarbuzz

PV Tech - www.pv-tech.org



Significant growth in worldwide installations of PV modules for 2008 has been reported by market research firm, Solarbuzz LLC. Installations reached 5.95GW - a growth rate of 110% compared to 2007, which saw installations reach 2.826GW. The PV industry generated \$37.1 billion in global revenues in 2008, according to Solarbuzz.

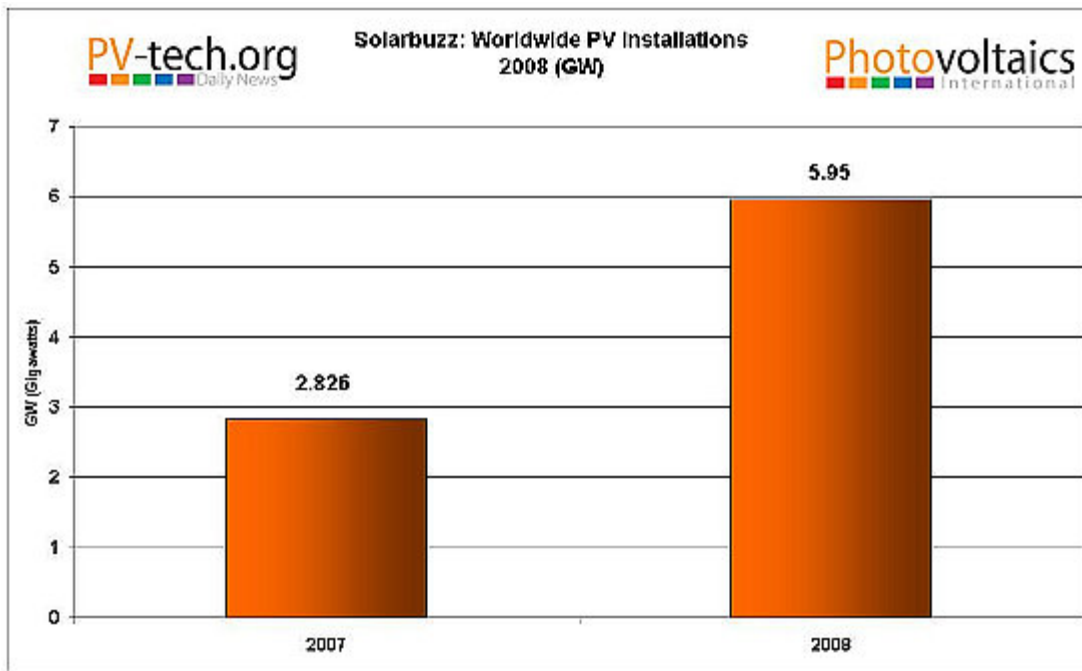
On a regional basis, Spain surpassed Germany for PV installations for the first time. Solarbuzz said that installations reached 2.46GW in 2008, compared to 1.86GW in Germany. The lack of a cap on installations, coupled to favourable FITs (Feed in Tariffs) in Spain were key factors behind the surge in installation in Spain. The Spanish Government has consequently imposed a 500MW cap on installations.



Europe accounted for 82% of world demand, strengthening its position as the key market for the PV industry.

"Twelve months ago, we projected that as early as the fourth quarter of 2008 the PV industry would no longer be constrained by solar module supply, but instead by market demand," said Craig Stevens, President of Solarbuzz LLC. "Now, the PV industry will need to navigate major changes in the regional demand mix, with new markets emerging, while addressing excess supply positions and significant adjustments to industry pricing."

Solar cell production was reported to have reached 6.85GW in 2008, up from 3.44GW in 2007. Solarbuzz noted that China and Taiwan increased their share of global solar cell production to 44% in 2008, up from 35% in 2007. Thin-film production grew by 123% to 0.89GW, according to the market research firm.



<http://www.pv-tech.org/lib/printable/4872/>

Published: 16 March 2009

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